Application 2336 Variable Air Volume Room Pressurization with Hot Water Reheat and Relative Humidity Control

Overview

In Application 2336, the controller modulates the supply and exhaust air for cooling, a reheat valve for heating, and a 0-10V humidification valve for relative humidity control. The controller also modulates the supply and exhaust air dampers to maintain a fixed CFM differential between the volumes of supply and exhaust air. When heating, the controller maintains minimum airflow. To work properly, the central air handling unit must provide both supply and exhaust air. Refer to Figures 2336-1 and 2336-2.

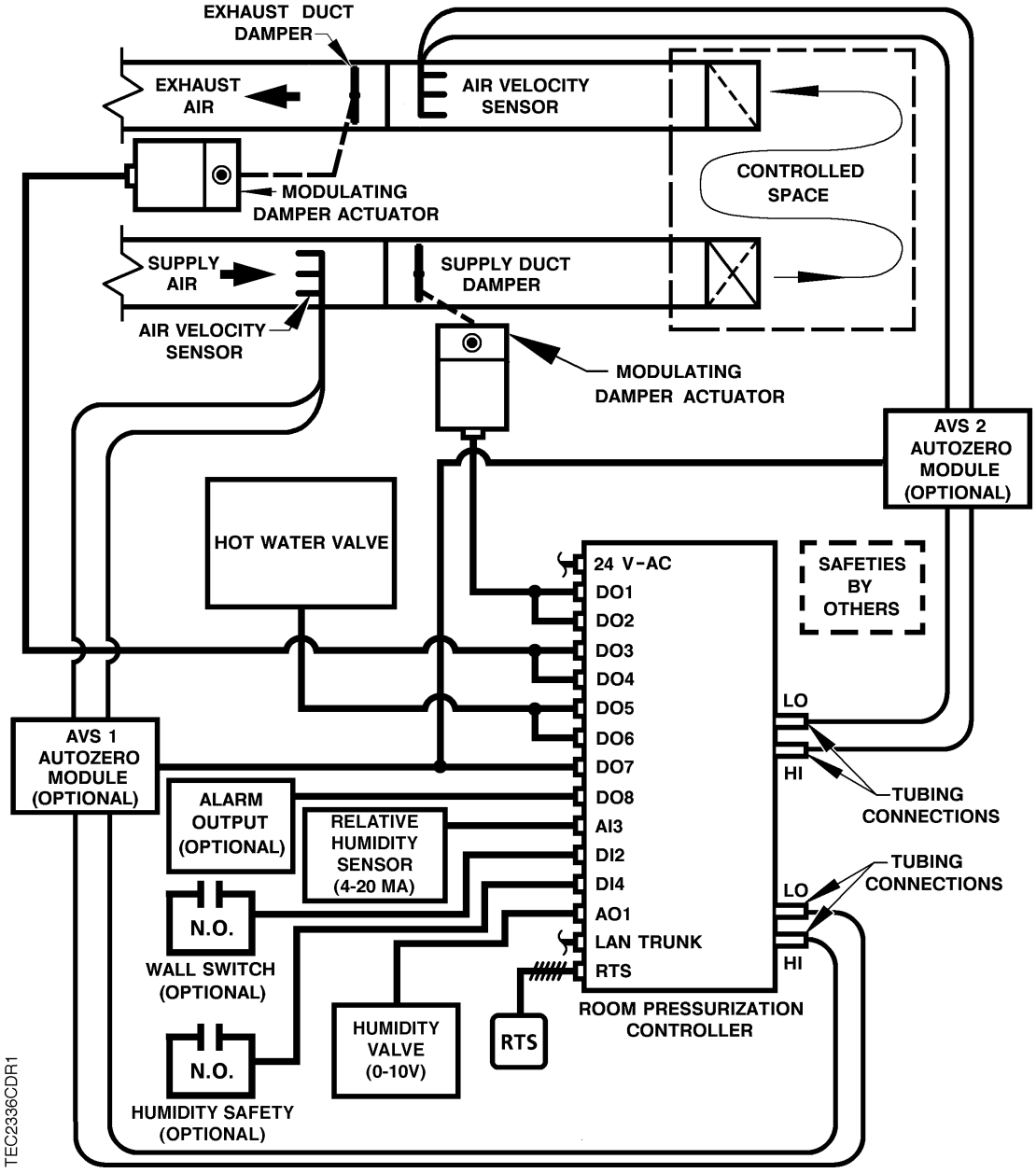
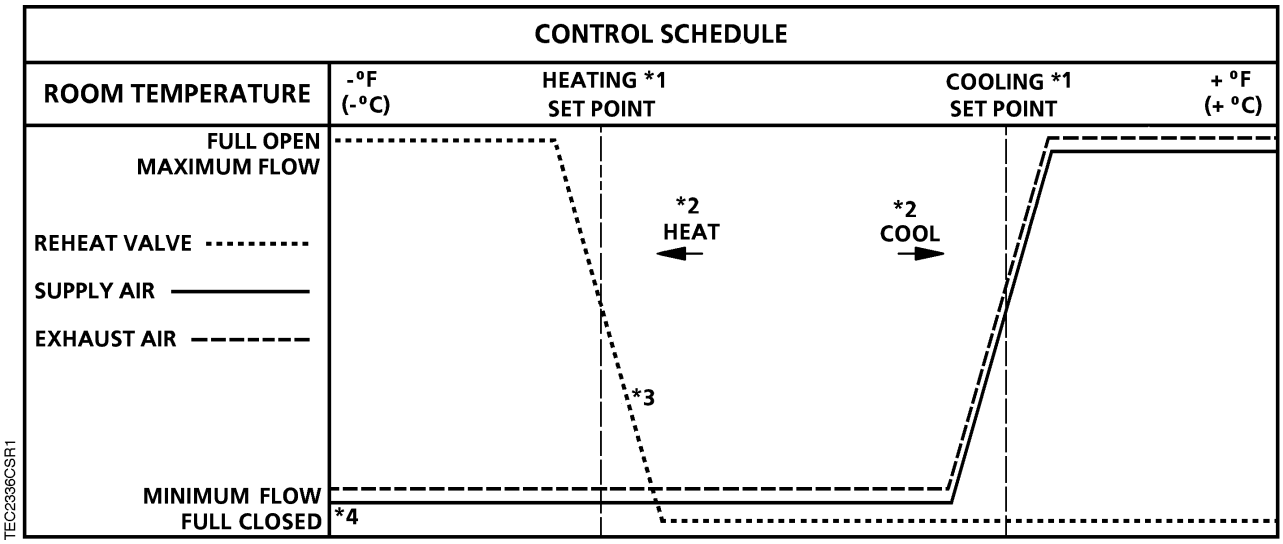


Figure 2336-1. Application 2336 Control Drawing.



NOTES:

1. Refer to Sequence of Operation, “Control temperature set points”.
2. Refer to Sequence of Operation, “Heating/cooling switchover”.
3. Refer to Sequence of Operation, “Hot water reheat” (optional).
4. The exhaust airflow is shown with a negative pressure offset from the supply airflow. Refer to Sequence of Operation, “Control loops”.

Figure 2336-2. Application 2336 Control Schedule.

Hardware inputs

analog

- air velocity sensor (2 required)
- relative humidity sensor (4-20mA)
- room temperature sensor
- room temperature set point dial (optional)

digital

- humidity safety (optional)
- night mode override (optional)
- wall switch (optional)

Hardware outputs

analog

- electronic 0-10V humidity valve actuator

digital

- alarm output (optional)
- Autozero Module (optional, 2 required if used)
- electronic damper actuator (2 required)
- electronic valve actuator (optional)

Point database

Table 2336-1 presents the point database information for Application 2336.

Sequence of Operation

The following paragraphs present the sequence of operation for Application 2336, “Variable Air Volume Room Pressurization with Hot Water Reheat and Relative Humidity Control”.

Control temperature set points

Depending on the controller's current operational mode (day or night), the control temperature set point, CTL STPT (number 92) holds the value of the following set points:

Day Mode – In day mode, CTL STPT holds the value of the point DAY CLG STPT (number 6) in heating mode or the point DAY HTG STPT (number 7) in cooling mode. If the room temperature sensor has a set point dial and the point STPT DIAL (number 14) is set to YES, then CTL STPT holds the value of the point RM STPT DIAL (number 13).

If the set point dial is used and the value of RM STPT DIAL is less that the value of the point RM STPT MIN (number 11), then CTL STPT holds the value of RM STPT MIN. If the value of RM STPT DIAL is greater than the value of the point RM STPT MAX (number 12), then CTL STPT holds the value of RM STPT MAX.

Night Mode – In night mode, CTL STPT holds the value of the point NGT CLG STPT (number 8) or the point NGT HTG STPT (number 9).

NOTE: The value of the point CTL TEMP (number 78) is the same as the value of the point ROOM TEMP (number 4), unless CTL TEMP is overridden.

Day and night modes

The day/night status of the space is determined by the value of the point DAY.NGT (number 29). The control of this point differs depending on whether the controller is monitoring the status of a wall switch or if the controller is connected to a field panel.

When a wall switch is physically connected to the termination strip on the controller at DI 2 (Figure 2336-4) and the point WALL SWITCH (number 18) equals YES, the controller monitors the point DI 2 (number 24). When the value of DI 2 is ON (the switch is closed), then DAY.NGT will be set to DAY indicating that the controller is in day mode. When the status of DI 2 is OFF (the switch is open), then DAY.NGT will be set to NIGHT indicating that the controller is in night mode.

When WALL SWITCH equals NO, the controller does not monitor the status of the wall switch, even if one is connected to it. In this case, if the controller is operating stand-alone, then the controller stays in day mode all the time. If the controller is operating with centralized control (that is, it is connected to a field panel), then the field panel can send an operator or PPCL command to override the status of DAY.NGT. Refer to *Powers Process Control Language (PPCL) User’s Manual* (125-1896) and *Field Panel User’s Manual* (125-1895) for more information.

Night mode override switch

If an override switch is present on the room temperature sensor and a value (in hours) other than zero has been entered into the point OVRD TIME (number 20), then by pressing the override switch a room occupant can reset the controller to day operational mode for the amount of time that is set in OVRD TIME. The status of the point NGT OVRD (number 21) changes to DAY. After the override time elapses, the controller returns to night mode and the status of NGT OVRD changes back to NIGHT.

Only when the controller is in night mode will the override switch on the room temperature sensor have any effect on the controller.

Heating/cooling switchover

The point HEAT.COOL (number 5) controls whether the controller is in heating mode or cooling mode. When the controller is in heating mode the status of HEAT.COOL reads HEAT; in cooling mode its status reads COOL.

If the following conditions are met for the length of time set in the point SWITCH TIME (number 86), then the controller switches from heating to cooling mode by setting HEAT.COOL to COOL.

- The value of the point HTG LOOPOUT (number 80) is less than 5%.
- The value of the point CTL TEMP (number 78) is above the value of the point CTL STPT (number 92) by at least the value set in the point SWITCH DBAND (number 90).
- The value of CTL TEMP is greater than the value of the appropriate cooling set point minus the value of SWITCH DBAND.

If the following conditions are met for the length of time set in SWITCH TIME, then the controller switches from cooling to heating mode by setting HEAT.COOL to HEAT.

- The value of the point CLG LOOPOUT (number 79) is less than 5%.
- The value of CTL TEMP is below the value of CTL STPT by at least the value of SWITCH DBAND.
- The value of CTL TEMP is less than the value of the appropriate heating set point minus the value of SWITCH DBAND.

Tracking mode

The point TRACK MODE (number 3) determines which airflow set point will lead and which will follow.

- If TRACK MODE is set to ETS (exhaust tracks supply), then the supply set point will be set to maintain temperature requirements, and based on the supply, the exhaust flow set point will be calculated to maintain the volume offset. The supply leads and the exhaust follows.
- If TRACK MODE is set to STE (supply tracks exhaust), then the exhaust set point will be set to maintain temperature requirements, and based on the exhaust, the supply flow set point will be calculated to maintain the volume offset. The exhaust leads and the supply follows.

Control volume set points

In cooling mode, the point CTL FLOW MIN (number 76) holds the value of the point CLG FLOW MIN (number 31), and the point CTL FLOW MAX (number 77) holds the value of the point CLG FLOW MAX (number 32).

In heating mode, CTL FLOW MIN holds the value of the point HTG FLOW MIN (number 33), and CTL FLOW MAX holds the value of the point HTG FLOW MAX (number 34).

You can set CLG FLOW MIN equal to, but not greater than, CLG FLOW MAX. Similarly, you can set HTG FLOW MIN equal to, but not greater than, HTG FLOW MAX. If you set the heating MIN and MAX points equal to each other, then the flow loop becomes constant volume with the temperature controlled by the hot water valve.

The supply and exhaust flows are each maintained by modulating the supply and exhaust dampers, respectively. One flow is determined by the room temperature requirements (VAV), while the other is determined by the differential flow requirements for pressurization. The point TRACK MODE (number 3) determines which is which. Refer to “Tracking mode” for details on ETS and STE.

VAV Flow Set Point – If TRACK MODE = ETS, then the point SUP FLO STPT (number 93) is calculated as follows:

In cooling mode, SUP FLO STPT is the result of scaling the point CLG LOOPOUT (number 79) between CLG FLOW MIN and CLG FLOW MAX. First, an intermediate value, the minimum set point percentage, is calculated:

$$\frac{\text{CLG FLOW MIN}}{\text{CLG FLOW MAX}} \times 100\% = \text{minimum set point}$$

Then SUP FLO STPT is calculated according to the following formula:

$$\left[\text{CLG LOOPOUT} \times (100\% - \text{minimum set point})\right] + \text{minimum set point} = \text{SUP FLO STPT}$$

Thus, when CLG FLOW MIN equals 0 CFM, the minimum set point is 0 and SUP FLO STPT equals CLG LOOPOUT. Otherwise, SUP FLO STPT will be larger than CLG LOOPOUT.

For example:

- If CLG FLOW MIN = 200 CFM and CLG FLOW MAX = 1000 CFM, then the minimum set point is (200 CFM / 1000 CFM) × 100% flow = 20%.

  When CLG LOOPOUT is 0%, SUP FLO STPT equals 20% flow. [0% × (100% – 20%)] + 20% = 20%. This ensures that the airflow out of the supply duct is no less than CLG FLOW MIN.

  When CLG LOOPOUT is 50%, SUP FLO STPT equals 60% flow. [50% × (100% – 20%)] + 20% = 60%.

When CLG LOOPOUT is 100%, SUP FLO STPT equals 100% flow. [100% × (100% – 20%)] + 20% = 100%. This ensures that the airflow out of the supply duct is not more than CLG FLOW MAX.

In heating mode, SUP FLO STPT typically equals the minimum set point which is (HTG FLOW MIN / HTG FLOW MAX) × 100%.

If TRACK MODE = STE, then the point EXH FLO STPT (number 85) is calculated as shown above.

Differential Flow Set Point – If TRACK MODE = ETS and the point ACTIVE.NTRAL (number 10) = ACTIVE, then EXH FLO STPT is calculated as follows:

The exhaust flow loop maintains a fixed VOLUME OFFST (number 88) in CFM (LPS) with a positive or negative, POS.NEG (number 25), differential between the supply and exhaust air volumes. This is accomplished using one of two tracking algorithms, determined by the value of the point TRACKING (number 82). If TRACKING is set to STPT, the exhaust set point tracks the supply set point.

For example:

- If CTL FLOW MAX = 1000 CFM, and VOLUME OFFST = 100 CFM with POS.NEG set to NEG, then EXH FLO STPT is 10% more than SUP FLO STPT. (100 CFM / 1000 CFM) × 100% flow = 10%.

  When SUP FLO STPT is 100%, EXH FLO STPT is 110%.

  When SUP FLO STPT is 50%, EXH FLO STPT is 60%.

  When SUP FLO STPT is 0%, EXH FLO STPT is 10%.

- With POS.NEG set to POS, the EXH FLO STPT is 10% less than the SUP FLO STPT. (100 CFM / 1000 CFM) × 100% flow = 10%.

  When SUP FLO STPT is 100%, EXH FLO STPT is 90%.

  When SUP FLO STPT is 50%, EXH FLO STPT is 40%.

  When SUP FLO STPT is 10%, EXH FLO STPT is 0%.

  NOTE: In this example, the controller would not allow SUP FLO STPT to fall below 10% because EXH FLO STPT cannot be less than 0%.

If ACTIVE.NTRAL = NTRAL, then EXH FLO STPT = SUP FLO STPT and VOLUME OFFST is not used.

If TRACKING equals FLOW, the exhaust set point tracks the actual supply flow, not the flow set point. Set point tracking typically provides more stable control. If the supply flow loop cannot maintain its set point, the flow tracking algorithm will maintain the flow differential.

If TRACK MODE = STE, then SUP FLO STPT is calculated as shown above.

Control loops

The Room Pressurization Controller uses five Proportional, Integral, Derivative (PID) control loops; two temperature loops, two flow loops, and a humidity loop.

Temperature Loops – The two temperature loops include a cooling loop and a heating loop. The active temperature loop maintains room temperature at the value in the point CTL STPT (number 92). Refer to “Control temperature set points”.

In cooling mode, the cooling loop generates the point CLG LOOPOUT (number 79) which is then used to generate the VAV flow set point.

In heating mode, the heating loop generates the point HTG LOOPOUT (number 80) which is then used to control the heating valve in order to maintain the room temperature.

Flow Loops – The *supply flow loop* maintains the SUP FLO STPT by modulating the supply air damper. The point SUPPLY FLOW (number 75) is the input value for the supply flow loop and is dependent upon the point SUP AIR VOL (number 35) and the point CTL FLOW MAX (number 77) according to the following formula:

$$\frac{\text{SUP AIR VOL}}{\text{CTL FLOW MAX}} \times 100\% = \text{SUPPLY FLOW}$$

- If SUP AIR VOL equals 0 CFM, then SUPPLY FLOW equals 0% flow.
- If SUP AIR VOL equals CTL FLOW MAX, then SUPPLY FLOW equals 100% flow.

The *exhaust flow loop* maintains the point EXH FLO STPT (number 85) by modulating the exhaust air damper. The point EXHAUST FLOW (number 74) is the input value for the exhaust flow loop and is dependent upon the point EXH AIR VOL (number 30) and CTL FLOW MAX according to the following formula:

$$\frac{\text{EXH AIR VOL}}{\text{CTL FLOW MAX}} \times 100\% = \text{EXHAUST FLOW}$$

- If EXH AIR VOL equals 0 CFM, then EXHAUST FLOW equals 0% flow.
- If EXH AIR VOL equals CTL FLOW MAX, then EXHAUST FLOW equals 100% flow.

Humidity Loop – The humidity loop and its associated control algorithm maintain the relative humidity, ROOM RH (number 15), at its set point, ROOM RH STPT (number 16). The humidity loop itself controls the specific humidity using the points SPEC HUM (number 22) and SPH CTL SET (number 23) by modulating the humidity valve. The specific humidity set point is reset to control relative humidity.

Relative humidity is affected by both the quantity of moisture in the air (specific humidity) and the temperature of the air. When the room temperature changes (rises), the relative humidity changes (decreases), even though the amount of moisture in the air stays the same. This is because relative humidity is the percentage ratio between the amount of moisture in the air and the amount of moisture the air can hold at a particular temperature. When the temperature rises, it is capable of holding more moisture, so the percentage ratio drops.

By controlling specific humidity, some of this interaction between temperature and relative humidity is eliminated. When the temperature set point is raised, the specific humidity set point is automatically recalculated to a higher level. This new level corresponds to the amount of moisture necessary to keep the relative humidity at its set point when the temperature reaches its new set point. The result is that both the temperature and the specific humidity will rise at the same time, while the relative humidity will stay constant.

The specific humidity and the specific humidity set point are constantly recalculated using the relative humidity and temperature readings and the relative humidity and temperature set points.

Positive/negative pressure switchover

When the point ACTIVE.NTRAL (number 10) is set to ACTIVE, the differential flow alarm feature is enabled and the point POS.NEG (number 25) is used to determine the pressurization mode. When ACTIVE.NTRAL is set to NTRAL, then the differential flow alarm feature is disabled (refer to “Differential flow alarm”) and neutral pressurization is used.

If POS.NEG is not overridden to POS or NEG, the point PT FAIL COND (number 89) is set to ALARM. The controller continues to operate in the last known mode of operation (positive, negative, or neutral). Overriding POS.NEG will return PT FAIL COND back to NORMAL.

Differential flow alarm

When the point ALARM OUT (number 50) is enabled (ACTIVE.NTRAL = ACTIVE), then its value changes from OFF to ON and DO8 turns on if either of the following conditions persists longer than the time value of the point ALARM DELAY (number 62):

- the value of the point ACTUAL OFFST (number 83) is greater than the sum of the points VOLUME OFFST (number 88) plus OFFSET LMT (number 61)
- the value of ACTUAL OFFST is less than the difference of VOLUME OFFST minus OFFSET LMT.

Hot water reheat

CAUTION:

Do not set the point HTG FLOW MIN (number 33) to 0 CFM. A minimum airflow must be provided across the heating coils when the heating valve is open.

The heating loop modulates the heating valve in order to warm up the space using a 0-10V output signal using the point HTG LOOPOUT (number 80). When in cooling mode, the heating valve is closed.

Calibration

Calibration of the controller's internal air velocity transducers is periodically required to maintain accurate air velocity readings. The point CAL SETUP (number 95) is set with the desired calibration option during controller start-up. Depending upon the value of CAL SETUP, calibration may be set to take place automatically or manually when the override switch is pressed on the room temperature sensor. If the value of the point CAL AIR (number 94) is YES, then calibration is in progress.

- For a controller used without Autozero Modules, the point CAL MODULE (number 87) is set to NO, the dampers are commanded closed simultaneously to get zero airflow readings during calibration.

- For a controller used with Autozero Modules, CAL MODULE is set to YES, calibration occurs without closing the damper.

Hot Water Valve – Calibration of a hot water valve (if used) is performed simultaneously with calibration of the air velocity transducers and is accomplished by commanding the valve closed. Calibration of the valve is not affected by the presence of Autozero Modules.

At the end of a calibration sequence, CAL AIR returns to NO automatically. A value of NO indicates that the controller is not in a calibration sequence.

The Autozero Modules are used during calibration when they are wired to DO7 and CAL MODULE is set to YES.

NOTE: The first time after start-up or initialization, the controller will calibrate the dampers as if not using Autozero Modules, although the Autozero Modules will be activated. All subsequent calibrations will use the Autozero Modules only.

Temperature and humidity interaction protection

Under most conditions the interaction between temperature and relative humidity is prevented because specific humidity is used as the loop input instead of relative humidity (refer to "Control loops"). Occasionally, additional protections are needed to prevent potentially hazardous conditions.

In some circumstances, the temperature loop is held constant while the humidity loop operates. In other circumstances, the humidity loop is held constant while the temperature loop operates. This protection only takes place when allowing both loops to operate simultaneously may lead to dangerously high or low relative humidity levels.

The temperature loop is held still under the following conditions:

1. Both temperature and humidity are low, and both temperature and humidity set points are raised, or the temperature set point is raised while the relative humidity is more than the point RH LIMIT (number 91) below its set point.

If both loops are allowed to operate, the temperature loop may move faster than the humidity loop, which would cause the relative humidity to dip to unacceptably low levels.

2. Both temperature and humidity are high, and both temperature and humidity set points are lowered, or the temperature set point is lowered while the relative humidity is more than RH LIMIT above its set point.

If both loops are allowed to operate, the temperature loop may move faster than the humidity loop, which would cause the relative humidity to rise to unacceptably high levels.

The humidity loop is held constant under the following conditions (these are more rare):

1. Temperature is low and humidity is high, both temperature and humidity set points are raised, and the relative humidity set point, although it has been raised, is still far below the relative humidity.

It is possible that the specific humidity needs to increase to meet the new set point requirements, although the relative humidity needs to decrease. The humidity loop is held constant until the relative humidity is within RH LIMIT of the relative humidity set point to prevent the relative humidity from going even higher. This condition might occur in the winter on a night-to-day changeover.

2. Temperature is high and humidity is low, both temperature and humidity set points are lowered, and the relative humidity set point, although it has been lowered, is still far above the relative humidity.

   It is possible that the specific humidity needs to decrease to meet the new set point requirements, although the relative humidity needs to increase. The humidity loop is held constant until either the temperature reaches its set point, or the relative humidity is within RH LIMIT of the relative humidity set point to prevent the relative humidity from dropping any further.

NOTE: When a loop is being held still, its set point is set equal to its input. Interaction protection can be prevented by setting RH LIMIT to 100%.

Damper status operation

When using the Autozero Modules, it is possible that after a long period of operation the calculated damper position may differ from the actual (physical) damper position.

If this occurs, the controller will automatically compensate for any difference by readjusting the value of the damper positions. This will happen if all of the following conditions are true:

- SUPPLY POS (number 49) = 100%
- SUP AIR VOL (number 35) > 0 CFM
- SUPPLY FLOW (number 75) < SUP FLO STPT (number 93)

In this case, the controller resets the value of SUPPLY POS to 75%, strokes the damper to 100%, and then checks to see if SUPPLY FLOW ≥ SUP FLO STPT. If not, the controller repeats this sequence. If after the fourth attempt the conditions are unchanged, then the controller discontinues attempts to recalibrate the damper position.

- or -

- SUPPLY POS = 0%
- SUP AIR VOL > 0 CFM
- SUPPLY FLOW > SUP FLO STPT

In this case, the controller resets the value of SUPPLY POS to 25%, strokes the damper to 0%, and then checks to see if SUPPLY FLOW ≤ SUP FLO STPT. If not, the controller repeats this sequence. If after the fourth attempt the conditions are unchanged, then the controller discontinues attempts to recalibrate the damper position.

This sequence will also be executed if these same conditions exist for the exhaust damper.

If the controller is still unable to maintain flow, then a mechanical problem might exist.

Fail-safe operation

If either one of the air velocity sensors fail (SUP AIR VOL (number 35) or EXH AIR VOL (number 30)), then the supply and exhaust dampers are controlled as follows:

- If the point FAIL MODE (number 40) is set to OPEN, then the controller sets the supply and exhaust dampers open.
- If FAIL MODE is set to CLOSED, then the controller sets the supply and exhaust dampers closed.

The hot water valve continues to operate as normal.

If the room temperature sensor fails and the points ROOM TEMP (number 4) and CTL TEMP (number 78) are not overridden, the hot water valve moves to fully open. In ETS mode, the supply damper moves to the minimum airflow position while the exhaust damper continues to maintain a fixed CFM differential between the supply air volume and exhaust air volume. (In STE mode, exhaust moves to the minimum position while the supply follows to maintain the airflow differential.)

The point PT FAIL COND (number 89) is set to ALARM if

- either one of the air velocity sensors fail
- the room temperature sensor fails (and neither ROOM TEMP nor CTL TEMP are overridden)
- the point POS.NEG (number 25) is not overridden.

Otherwise a NORMAL value will be displayed.

If the point RM STPT DIAL (number 13) fails, the controller operates with the last known set point dial value.

If the point SUP AIR VOL (number 35) falls below the value held in the point LOW FLOW (number 84), the humidity valve will be closed to prevent condensation in the duct. For the humidity control to be re-enabled, the air volume must then rise above the value held either in the point CLG FLOW MIN (number 31) in cooling mode or the point HTG FLOW MIN (number 33) in heating mode.

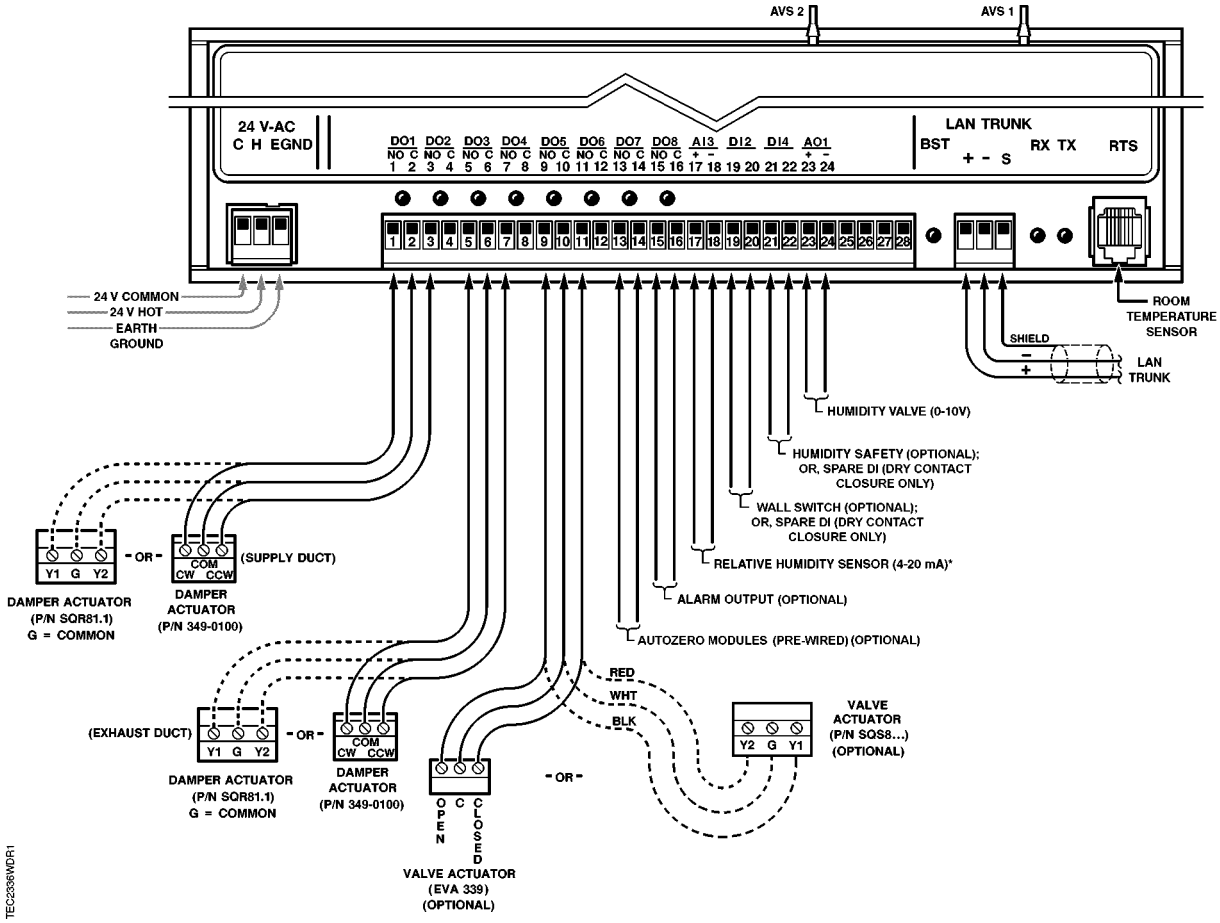
Application notes

If the temperature swings in the room are excessive or if there is trouble in maintaining the set point, then either the cooling loop, the heating loop or both need to be tuned. If the point SUPPLY FLOW (number 75) is oscillating while the point SUP FLO STPT (number 93) is constant, then the supply flow loop requires tuning. If the EXHAUST FLOW (number 74) is oscillating while the point EXH FLO STPT (number 85) is constant, then the exhaust flow loop requires tuning.

Wiring diagram

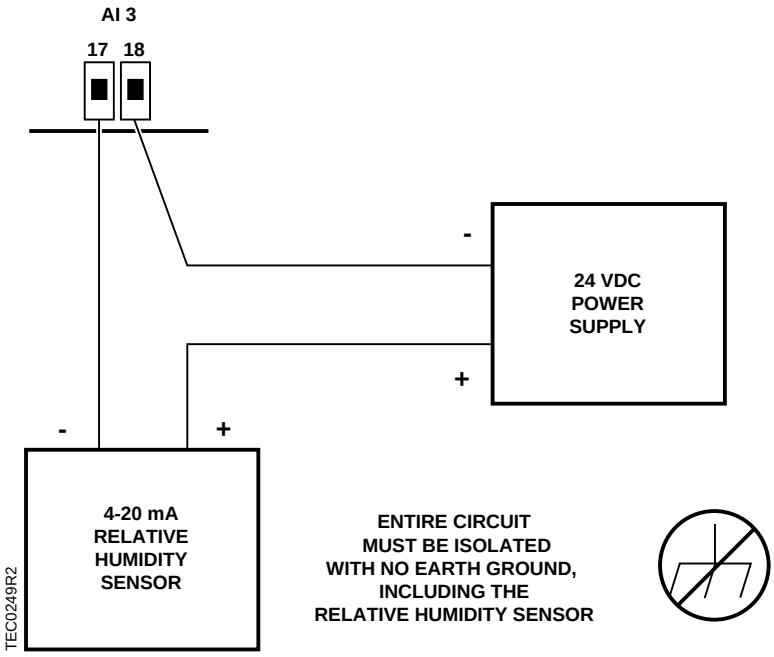
The point wiring for Application 2336 is shown in Figures 2336-3 and 2336-4.

CAUTION: The Controller's Digital Outputs (DOs) control 24 Vac loads only. The maximum rating is 12 VA for each DO. For higher VA requirements, 110 or 220 Vac requirements, separate transformers used to power the load, or DC power requirements, use an interposing 220 V 4-relay module (P/N 540-147).



* Refer to Figure 2336-4 for wiring of 4-20 mA sensor.

Figure 2336-3. Application 2336 Wiring Diagram.



NOTE: Each 4-20 mA sensor requires a dedicated 24 VDC power supply.

Figure 2336-4. Wiring Diagram for AI3 if a 4-20 mA Sensor is Used.

Table 2336-1. Point Database for Application 2336.

Point Number	Descriptor	Factory Default (SI Units)	Engr. Units (SI Units)	Slope (SI Units)	Intercept (SI Units)	On Text	Off Text
01	CTLR ADDRESS	99	--	1	0	--	--
02	APPLICATION	2394	--	1	0	--	--
03	TRACK MODE	ETS	--	--	--	STE	ETS
{04}	ROOM TEMP	74.00 (23.44888)	DEG F (DEG C)	0.25 (0.14)	48 (8.88888)	--	--
{05}	HEAT.COOL	COOL	--	--	--	HEAT	COOL
06	DAY CLG STPT	74.00 (23.44888)	DEG F (DEG C)	0.25 (0.14)	48 (8.88888)	--	--
07	DAY HTG STPT	70.00 (21.20888)	DEG F (DEG C)	0.25 (0.14)	48 (8.88888)	--	--
08	NGT CLG STPT	82.00 (27.92888)	DEG F (DEG C)	0.25 (0.14)	48 (8.88888)	--	--
09	NGT HTG STPT	65.00 (18.40888)	DEG F (DEG C)	0.25 (0.14)	48 (8.88888)	--	--
{10}	ACTIVE.NTRAL	NTRAL	--	--	--	ACTIVE	NTRAL
11	RM STPT MIN	55.00 (12.80888)	DEG F (DEG C)	0.25 (0.14)	48 (8.88888)	--	--
12	RM STPT MAX	90.00 (32.40888)	DEG F (DEG C)	0.25 (0.14)	48 (8.88888)	--	--
{13}	RM STPT DIAL	74.00 (23.44888)	DEG F (DEG C)	0.25 (0.14)	48 (8.88888)	--	--
14	STPT DIAL	NO	--	--	--	YES	NO
{15}	ROOM RH	0.0	PCT	0.4	0	--	--
{16}	ROOM RH STPT	50.0	PCT	0.4	0	--	--
{17}	AOV1	0.00	VOLTS	0.01	0	--	--
18	WALL SWITCH	NO	--	--	--	YES	NO
{19}	DI OVRD SW	OFF	--	--	--	ON	OFF
20	OVRD TIME	1	HRS	1	0	--	--
{21}	NGT OVRD	NIGHT	--	--	--	NIGHT	DAY
{22}	SPEC HUM	0.0	--	0.1	0	--	--
{23}	SPH CTL SET	50.0	--	0.1	0	--	--
{24}	DI 2	OFF	--	--	--	ON	OFF
{25}	POS.NEG	NEG	--	--	--	POS	NEG
26	EXHFLO PGAIN	0.00	--	0.05	0	--	--
27	EXHFLO IGAIN	0.010	--	0.001	0	--	--
{28}	HIGH HUM DI4	OFF	--	--	--	ON	OFF
{29}	DAY.NGT	DAY	--	--	--	NIGHT	DAY
{30}	EXH AIR VOL	0 (0.0000)	CFM (LPS)	4 (1.8876)	0	--	--
31	CLG FLOW MIN	220 (103.8180)	CFM (LPS)	4 (1.8876)	0	--	--
32	CLG FLOW MAX	2200 (1038.1800)	CFM (LPS)	4 (1.8876)	0	--	--
33	HTG FLOW MIN	220 (103.8180)	CFM (LPS)	4 (1.8876)	0	--	--
34	HTG FLOW MAX	2200 (1038.1800)	CFM (LPS)	4 (1.8876)	0	--	--
{35}	SUP AIR VOL	0 (0.0000)	CFM (LPS)	4 (1.8876)	0	--	--
36	SUP FLO COEF	1.00	--	0.01	0	--	--

NOTES:
1. Points not listed are not used in this application.
2. A single value in a column means that the value is the same in English units and in SI units.
3. Point numbers that appear in brackets {} may be unbundled at the field panel.

Table 2336-1. Point Database for Application 2336.

Point Number	Descriptor	Factory Default (SI Units)	Engr. Units (SI Units)	Slope (SI Units)	Intercept (SI Units)	On Text	Off Text
{37}	VALVE COMD	0.0	PCT	0.4	0	--	--
{38}	VALVE POS	0.0	PCT	0.4	0	--	--
39	MTR3 TIMING	130	SEC	1	0	--	--
40	FAIL MODE	OPEN	--	--	--	CLOSED	OPEN
{41}	DO 1	OFF	--	--	--	ON	OFF
{42}	DO 2	OFF	--	--	--	ON	OFF
{43}	DO 3	OFF	--	--	--	ON	OFF
{44}	DO 4	OFF	--	--	--	ON	OFF
{45}	DO 5	OFF	--	--	--	ON	OFF
{46}	DO 6	OFF	--	--	--	ON	OFF
{47}	AUTOZERO MOD	OFF	--	--	--	ON	OFF
{48}	SUPPLY COMD	0.0	PCT	0.4	0	--	--
{49}	SUPPLY POS	0.0	PCT	0.4	0	--	--
{50}	ALARM OUT	OFF	--	--	--	ON	OFF
51	MTR1 TIMING	95	SEC	1	0	--	--
{52}	EXHAUST COMD	0.0	PCT	0.4	0	--	--
{53}	EXHAUST POS	0.0	PCT	0.4	0	--	--
54	EXH FLO COEF	1.00	--	0.01	0	--	--
55	MTR2 TIMING	95	SEC	1	0	--	--
56	AOV1 START	0.00	VOLTS	0.01	0	--	--
57	AOV1 SPAN	10.00	VOLTS	0.01	0	--	--
58	MTR SETUP	0	--	1	0	--	--
59	DO DIR.REV	0	--	1	0	--	--
60	EXHDUCT AREA	1.000 (0.092920)	SQ. FT (SQ M)	0.025 (0.002323)	0	--	--
61	OFFSET LMT	16 (7.5504)	CFM (LPS)	4 (1.8876)	0	--	--
62	ALARM DELAY	10	SEC	1	0	--	--
63	CLG P GAIN	20.00 (36.00)	--	0.25 (0.45)	0	--	--
64	CLG I GAIN	0.010 (0.0180)	--	0.001 (0.0018)	0	--	--
65	CLG D GAIN	0 (0.0)	--	2 (3.6)	0	--	--
66	SPH P GAIN	5.00 (9.00)	--	0.25 (0.45)	0	--	--
67	HTG P GAIN	10.00 (18.00)	--	0.25 (0.45)	0	--	--
68	HTG I GAIN	0.010 (0.0180)	--	0.001 (0.0018)	0	--	--
69	HTG D GAIN	0 (0.0)	--	2 (3.6)	0	--	--
70	SPH I GAIN	0.005 (0.0090)	--	0.001 (0.0018)	0	--	--
71	SUPFLO PGAIN	0.00	--	0.05	0	--	--
72	SUPFLO IGAIN	0.010	--	0.001	0	--	--

NOTES:
1. Points not listed are not used in this application.
2. A single value in a column means that the value is the same in English units and in SI units.
3. Point numbers that appear in brackets {} may be unbundled at the field panel.

Table 2336-1. Point Database for Application 2336.

Point Number	Descriptor	Factory Default (SI Units)	Engr. Units (SI Units)	Slope (SI Units)	Intercept (SI Units)	On Text	Off Text
73	SPH D GAIN	0 (0.0)	--	2 (3.6)	0	--	--
{74}	EXHAUST FLOW	0.00	PCT	0.25	0	--	--
{75}	SUPPLY FLOW	0.00	PCT	0.25	0	--	--
{76}	CTL FLOW MIN	220 (103.8180)	CFM (LPS)	4 (1.8876)	0	--	--
{77}	CTL FLOW MAX	2200 (1038.1800)	CFM (LPS)	4 (1.8876)	0	--	--
{78}	CTL TEMP	74.00 (23.44888)	DEG F (DEG C)	0.25 (0.14)	48 (8.88888)	--	--
{79}	CLG LOOPOUT	0.0	PCT	0.4	0	--	--
{80}	HTG LOOPOUT	0.0	PCT	0.4	0	--	--
{81}	HUM LOOPOUT	0.0	PCT	0.4	0	--	--
82	TRACKING	STPT	--	--	--	FLOW	STPT
{83}	ACTUAL OFFST	0 (0.0)	CFM (LPS)	4 (1.8876)	-8000 (-3775.2)	--	--
84	LOW FLOW	200 (94.3800)	CFM (LPS)	4 (1.8876)	0	--	--
{85}	EXH FLO STPT	0.00	PCT	0.25	0	--	--
86	SWITCH TIME	10	MIN	1	0	--	--
87	CAL MODULE	NO	--	--	--	YES	NO
{88}	VOLUME OFFST	0 (0.0000)	CFM (LPS)	4 (1.8876)	0	--	--
{89}	PT FAIL COND	NORMAL	--	--	--	ALARM	NORMAL
90	SWITCH DBAND	1.00 (0.56)	DEG F (DEG C)	0.25 (0.14)	0	--	--
91	RH LIMIT	2.0	PCT	0.4	0	--	--
{92}	CTL STPT	74.00 (23.44888)	DEG F (DEG C)	0.25 (0.14)	48 (8.88888)	--	--
{93}	SUP FLO STPT	0.00	PCT	0.25	0	--	--
{94}	CAL AIR	NO	--	--	--	YES	NO
95	CAL SETUP	4	--	1	0	--	--
96	CAL TIMER	12	HRS	1	0	--	--
97	SUPDUCT AREA	1.000 (0.092920)	SQ. FT (SQ M)	0.025 (0.002323)	0	--	--
98	AO DIR.REV	0	--	1	0	--	--
{99}	ERROR STATUS	0	--	1	0	--	--

NOTES:
1. Points not listed are not used in this application.
2. A single value in a column means that the value is the same in English units and in SI units.
3. Point numbers that appear in brackets {} may be unbundled at the field panel.